Notice of Allowability	Application No.	Applicant(s)	
	10/698,028	SIKHARULIDZE, DAVID	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed 5/16/07*.

2. ☒ The allowed claim(s) is/are *1-3,5,6 and 8-32*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *5/22/07* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other *See Continuation Sheet*.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Alan Lowe on May 22, 2007.

The application has been amended as follows:

2. Claim 4 is cancelled because it contains redundant subject matter that is already present in parent claim 1.

Drawings

3. After a re-evaluation of all the drawings submitted by Applicant, Figures 1-2, 3a-3b, 4a-4b, 5, 6a-6b, 7-8 in the submission dated 4/02/04, and Figures 9a-9b, 10a-10b, 11a-11b, 12 in the submission dated 04/05/06, are accepted as being the best representations available.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance.

The closest cited prior art of record, US 5,357,358 in view of US 5,729,320, fails to teach or suggest, even when further in view of US 6,549,256, US 6,515,649 and US 5,729,320, the combination of:

(i) A bistable liquid crystal display device comprising: two cell walls enclosing a layer of a composition comprising nematic liquid crystal material and finely divided solid particles dispersed therein, at least one of said cell walls being translucent; at least one electrode on each of said cell walls for applying an electric field across at least some of said liquid crystal material; a first surface alignment on an inner surface of one of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a first orientation, and a second surface alignment on an inner surface of the other of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a second orientation which is different from said first orientation; said nematic liquid crystal material being arranged so it has a first stable molecular configuration in response to a first unidirectional electric field of a first direction, suitable magnitude and duration being applied across said electrodes and a second stable molecular configuration in response to a second unidirectional electric field of a second direction, said second configuration being different from said first configuration, the first and second directions being opposite to each other; and drive electronics for applying the electric field to the electrodes, the electric fields and the cell walls being such that (A) (a) the first surface has a molecular alignment that is always homeotropic while the

electric fields are applied to the electrodes, and (b) the second surface has a molecular alignment that is planar in response to the electric field extending in the first direction, and switches to homeotropic in response to the electric field switching from the first direction to the second direction, or (B) (a) the first surface has a molecular alignment that is always planar while the electric fields are applied to the electrodes, and (b) the second surface has a molecular alignment that is homeotropic in response to the electric field extending in the first direction, and switches to planar in response to the electric field switching from the first direction to the second direction (none of the references teach the combination wherein the first surface always has a homeotropic alignment when the electric fields are applied while the second surface alignment is planar in response to an electric field extending in a first direction and switches to homeotropic in response to the electric field switching from the first direction to the second direction; or the combination wherein the first surface always has a planar alignment when the electric fields are applied while the second surface alignment is homeotropic in response to an electric field extending in a first direction and switches to planar in response to the electric field switching from the first direction to the second direction); or

ii) A bistable liquid crystal display device comprising: two cell walls enclosing a layer of nematic liquid crystal material, at least one of said cell walls being translucent; said liquid crystal material having finely divided solid particles dispersed therein, said particles having sizes in the range 1 to 500 nm; at least one electrode on each cell wall for applying an electric field across at least some of said liquid crystal material; a first

surface alignment on an inner surface of one cell wall for inducing adjacent molecules of said liquid crystal material to adopt a first orientation; a second surface alignment on an inner surface of the other cell wall for inducing adjacent molecules of said liquid crystal material to adopt a second orientation; a structure for distinguishing between different optical states of said liquid crystal material; and drive electronics connected to said electrodes for applying DC electric fields to said liquid crystal material, a first of the fields having a magnitude, a first direction and duration to cause the liquid crystal material to have a first stable optical state, a second of the fields, having a magnitude, second direction and duration to cause the liquid crystal material to have a second stable optical state, the first and second directions being opposite to each other, the first and second stable optical states differing from each other, wherein the drive electronics is arranged to cause the electric field lines to be such that (A) (a) the first surface has a molecular alignment that is always homeotropic while the electric fields are applied to the electrodes, and (b) the second surface has a molecular alignment that is planar in response to the electric field extending in the first direction and switches to homeotropic in response to the electric field switching from the first direction to the second direction, or (B) (a) the first surface has a molecular alignment that is always planar while the electric fields are applied to the electrodes, and (b) the second surface has a molecular alignment that is homeotropic in response to the electric field extending in the first direction, and switches to planar in response to the electric field switching from the first direction to the second direction (none of the references teach the combination wherein the first surface always has a homeotropic alignment when the

electric fields are applied while the second surface alignment is planar in response to an electric field extending in a first direction and switches to homeotropic in response to the electric field switching from the first direction to the second direction; or the combination wherein the first surface always has a planar alignment when the electric fields are applied while the second surface alignment is homeotropic in response to an electric field extending in a first direction and switches to planar in response to the electric field switching from the first direction to the second direction); or

iii) An electrophoretically-controlled bistable liquid crystal display device comprising: a first cell wall and a second cell wall enclosing a layer of a composition comprising a nematic liquid crystal material having finely divided charged particles dispersed therein, at least one of said cell walls being translucent; at least one electrode on each cell wall for applying an electric field across at least some of said liquid crystal material; and a first surface alignment on an inner surface of said first cell wall for inducing adjacent molecules of said liquid crystal material to adopt a first orientation, and a second surface alignment on an inner surface of said second cell wall for inducing adjacent molecules of said liquid crystal material to adopt a second orientation which is different from said first orientation; whereby said liquid crystal material can be switched to a first stable molecular configuration by the application of a DC electric field pulse of suitable field strength and duration to cause movement of charged particles to said first cell wall so as to substantially prevent said first surface alignment from influencing alignment of molecules of liquid crystal material in said layer; and said liquid crystal material can be switched from said first configuration to a second stable molecular configuration by the

application of a DC electric field pulse of suitable field strength and duration and opposite polarity so as to cause movement of sufficient charged particles away from said first cell wall to permit said first surface alignment to influence alignment of molecules of liquid crystal material in said layer (none of the references teach the combination wherein the liquid crystal material can be switched to a first stable molecular configuration by the application of a DC electric field pulse of suitable field strength and duration to cause movement of charged particles to the first cell wall so as to prevent the first surface alignment from influencing the alignment of the molecules of liquid crystal material in the layer; and the liquid crystal material can be switched from the first configuration to a second stable molecular configuration by the application of a DC electric field pulse of suitable field strength and duration and opposite polarity so as to cause movement of sufficient charged particles away from the first cell wall to permit the first surface alignment to influence the alignment of the molecules of liquid crystal material in the layer); or

iv) An electrophoretically-controlled bistable liquid crystal display device comprising: a first cell wall and a second cell wall enclosing a layer of nematic liquid crystal material, at least one of said cell walls being translucent; said liquid crystal material having finely divided charged particles dispersed therein; at least one electrode on each cell wall for applying an electric field across at least some of said liquid crystal material; and a first surface alignment on an inner surface of said first cell wall for inducing adjacent molecules of said liquid crystal material to adopt a planar alignment, and a second surface alignment on an inner surface of said second cell wall for inducing adjacent

molecules of said liquid crystal material to adopt a homeotropic alignment; whereby said liquid crystal material can be switched to a stable homeotropic alignment by the application of a DC electric field pulse of suitable field strength and duration to cause movement of charged particles to said first cell wall so as to substantially prevent said first surface alignment from influencing alignment of molecules of liquid crystal material in said layer; and said liquid crystal material can be switched from said stable homeotropic alignment to a stable planar alignment by the application of a DC electric field pulse of suitable field strength and duration and opposite polarity so as to cause movement of sufficient charged particles away from said first cell wall to permit said first surface alignment to influence alignment of molecules of liquid crystal material in said layer (none of the references teach the combination wherein the liquid crystal material can be switched to a first stable molecular configuration by the application of a DC electric field pulse of suitable field strength and duration to cause movement of charged particles to the first cell wall so as to prevent the first surface alignment from influencing the alignment of the molecules of liquid crystal material in the layer; and the liquid crystal material can be switched from the first configuration to a second stable molecular configuration by the application of a DC electric field pulse of suitable field strength and duration and opposite polarity so as to cause movement of sufficient charged particles away from the first cell wall to permit the first surface alignment to influence the alignment of the molecules of liquid crystal material in the layer).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

05/22/07

RENA DYE
SUPERVISORY PATENT EXAMINER
Tech Center 1700

Continuation of Attachment(s) 9. Other: 1) Figs. 1-2, 3a-3b, 4a-4b, 5, 6a-6b, 7-8, in the submission dated 4/02/04,and 2) Fig. 9a-9b, 10a-10b, 11a-11b, 12, in the submission dated 04/05/06, are accepted by the examiner .